WHAT IS CLAIMED IS

1.

A bulk acoustic wave (BAW) device comprising:

a first electrode and a second electrode; and

a piezoelectric film located between the first electrode and the second electrode and having a crystal orientation predominantly oriented according to a <100> orientation.

2.

The device of claim 1, wherein the piezoelectric film is a lead zirconium titanate (PZT) film.

3.

The device of claim 1, wherein the piezoelectric film is switchable between a first electrical condition when a first DC voltage difference value is applied to the first and second electrodes, and a second electrical condition when a second DC voltage difference value, different from the first voltage difference value, is applied to the first and second electrodes.

4.

The device of claim 3, wherein the first electrical condition of the piezoelectric film corresponds to an OFF condition of the BAW device and the second electrical condition of the piezoelectric film corresponds to an ON condition of the BAW device.

5.

The device of claim 4, wherein the first electrical condition of the piezoelectric film corresponds to a non-polarized electrical field inside the piezoelectric film and the second electrical condition of the piezoelectric film corresponds to a polarized electrical field inside the piezoelectric film.

6.

The device of claim 3, wherein the first electrical condition of the piezoelectric film corresponds to an ON condition of the BAW device and the second electrical condition of the piezoelectric film corresponds to an OFF condition of the BAW device.

7.

The device of claim 6, wherein the first electrical condition of the piezoelectric film corresponds to a polarized electrical field inside the piezoelectric film and the second electrical condition of the piezoelectric film corresponds to a non-polarized electrical field inside the piezoelectric film.

8.

A method for switching a bulk acoustic wave (BAW) device comprising a first electrode, a second electrode, and a piezoelectric film located between the first electrode and the second electrode, the method comprising the steps of:

applying a first DC voltage difference value between the first and second electrode; and

applying a second DC voltage difference value between the first and second electrode, the second DC voltage difference value reversing electric field direction in the piezoelectric film.

9.

The method of claim 8, wherein:

the device is in an ON-state after application of the first DC voltage difference value and before application of the second DC voltage difference value; and

the device is in an OFF-state after application of the second DC voltage difference value.

10.

The method of claim 8, wherein application of the first DC voltage difference value aligns <100> oriented dipoles in the piezoelectric film and application of

the second DC voltage difference value disaligns <100> oriented dipoles in the piezoelectric film.

11.

A filter bank having a filter bank input and a filter bank output, and comprising a plurality of bulk acoustic wave (BAW) devices, wherein:

each BAW device has a device input and a device output, and comprises a first electrode, a second electrode and a piezoelectric film located between the first electrode and the second electrode, each device input being connected with the filter bank input and each device output being connected with the filter bank output;

each BAW device has a predetermined frequency band and is switchable between an ON condition and an OFF condition, the ON condition allowing transmission of an RF signal from the device input to the device output and the OFF condition blocking transmission of the RF signal from the device input to the device output; and

one of the BAW devices is in an ON condition and the remaining BAW devices are in an OFF condition, thus allowing RF signals having same frequency band as the frequency band of the BAW device in the ON condition to be transmitted from the filter bank input to the filter bank output.

12.

The filter bank of claim 11, wherein the piezoelectric film is lead zirconium titanate (PZT) film having a crystal orientation predominantly oriented according to a <100> orientation.

13.

The filter bank of claim 11 wherein switching of the BAW devices is obtained by application of a DC voltage difference between the first electrode and the second electrode.

14.

A bulk acoustic wave (BAW) device comprising:

a first electrode and a second electrode;

a piezoelectric film electrically connecting the first electrode to the second electrode and having a polarization controllable by application of an electric field, wherein the first electrode, the second electrode, and the piezoelectric film form a resonator; and

a substrate located below the resonator.

15.

A bulk acoustic wave (BAW) device comprising:

a first electrode and a second electrode;

a piezoelectric film electrically connecting the first electrode to the second electrode and having a polarization controllable by application of a tensile stress, wherein the first electrode, the second electrode, and the piezoelectric film form a resonator; and

a substrate on which the resonator is located.